

PATENT SPECIFICATION
DRAWINGS ATTACHED

855,613



Date of Application and filing Complete Specification:
September 3, 1959.

No. 30123/59.

Application made in United States of America on
September 18, 1958.

Complete Specification Published December 7 1960.

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Improvements relating to suction nozzles.
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CORRECTION OF CLERICAL ERROR

SPECIFICATION NO. 855,613

The following correction is in accordance with the Decision of the
Superintending Examiner, acting for the Comptroller-General, dated the seventh day
of February, 1961.

Page 1, line 18, *before* "nozzle" *for* "section" *read* "suction"

THE PATENT OFFICE,
3rd March, 1961

DS 87754/1(1)/R.153 200 2/61 PL

20 mouth having front and rear lips is
characterised by a resilient blade mounted
in the nozzle and having a pair of parallel
wiping edges spaced apart a distance not
less than approximately half the distance
25 between the nozzle lips, and capable of
rocking as the nozzle is moved to and fro
over the floor, so that as each edge moves
approximately to the middle of the nozzle
mouth the opposite edge moves close to the
30 adjacent lip of the nozzle, so that as the
nozzle moves forward its rear half is sub-
stantially closed and as it moves backwards
its front half is substantially closed.

35 Preferably the blade includes a thin hinge
portion permitting it to rock due to its own
resilience, and below the hinge portion
widens out so that the spacing between its
wiping edges is substantially greater than
the thickness of its hinge portion.

40 In one form of the invention the lower
part of the blade is of inverted V-section,
the two limbs of which respectively afford
the two wiping edges. Each limb of the V
is preferably sufficiently slender to flex
45 independently of the flexing of the upper

with reference to the accompanying draw-
ings in which

Figure 1 is a central sectional side eleva-
tion of a water pick up nozzle showing the
wiping blade in its normal stationary posi-
tion.

Figure 2 is an under-plan view in the
direction of the arrows 2—2 of Figure 1
and

Figure 3 and 4 are views similar to part
of Figure 1 showing the positions of the
blade respectively when the nozzle is moving
75 forward and when it is moving backward.

The water pick-up nozzle shown in the
drawings comprises a body 10 affording an
elongated nozzle 11 having an internal
chamber 12 opening at the bottom in a
80 mouth 13. Communicating with the cham-
ber 12 is a tubular socket 14 to receive the
end of a wand or suction tube 16 com-
municating with a source of suction through
a separator so as to draw a stream of air
85 and entrained liquid into the nozzle and
separate the liquid from the air. A pin 15
on the wand is received in an annular recess
17 in the socket to hold the two parts
together whilst permitting relative rotation. 90

(Price 3s. 6d.)

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We, HOOVER LIMITED, a Company, registered under the Laws of Great Britain, of Perivale, Greenford, Middlesex, do hereby declare the invention, for which we pray

5 that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

This invention relates to liquid pick-up suction nozzles, and an object of the invention is to provide a suction nozzle having a wiping blade to act as an effective squeegee for collecting dirty solution on a surface being cleaned, and enabling it to

10 be effectively removed by a current of air drawn into the nozzle.

According to the present invention a liquid pick-up section nozzle including a hollow body affording an elongated suction mouth having front and rear lips is

20 characterised by a resilient blade mounted in the nozzle and having a pair of parallel wiping edges spaced apart a distance not less than approximately half the distance

25 between the nozzle lips, and capable of rocking as the nozzle is moved to and fro over the floor, so that as each edge moves approximately to the middle of the nozzle mouth the opposite edge moves close to the

30 adjacent lip of the nozzle, so that as the nozzle moves forward its rear half is substantially closed and as it moves backwards its front half is substantially closed.

Preferably the blade includes a thin hinge portion permitting it to rock due to its own resilience, and below the hinge portion widens out so that the spacing between its wiping edges is substantially greater than the thickness of its hinge portion.

40 In one form of the invention the lower part of the blade is of inverted V-section, the two limbs of which respectively afford the two wiping edges. Each limb of the V is preferably sufficiently slender to flex

45 independently of the flexing of the upper

hinge part.

The arrangement may be such that in the position of rest, both wiping edges lie substantially in the plane of contact between the nozzle lip and the floor, whilst the flexibility of the individual limbs in relation to that of the hinge portion and the dimensions of the parts are such that when each wiping edge rocks to the centre of the nozzle it can remain substantially in the said plane.

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In one arrangement the lips are formed with alternating projections and recesses so that while the projections rest on the floor liquid and a high velocity air stream can pass through the recesses of the leading lip.

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The invention may be carried into practice in various ways but one specific embodiment will be described by way of example with reference to the accompanying drawings in which

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Figure 1 is a central sectional side elevation of a water pick up nozzle showing the wiping blade in its normal stationary position

Figure 2 is an under-plan view in the direction of the arrows 2—2 of Figure 1 and

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Figure 3 and 4 are views similar to part of Figure 1 showing the positions of the blade respectively when the nozzle is moving forward and when it is moving backward.

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The water pick-up nozzle shown in the drawings comprises a body 10 affording an elongated nozzle 11 having an internal chamber 12 opening at the bottom in a

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mouth 13. Communicating with the chamber 12 is a tubular socket 14 to receive the end of a wand or suction tube 16 communicating with a source of suction through a separator so as to draw a stream of air and entrained liquid into the nozzle and separate the liquid from the air. A pin 15 on the wand is received in an annular recess 17 in the socket to hold the two parts together whilst permitting relative rotation.

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(Price 3s. 6d.)

between them.

The mouth 13 of the nozzle is defined by spaced ribs 18, to which a bottom plate 19 is secured by screws 20. The plate extends the full length of the nozzle mouth and as shown in the drawings its cross-section comprises a central upper channel or looped section portion 21, a pair of horizontal platforms 22 and a pair of outer channel sections 23 and 24 which fit over the ribs 18. The horizontal platforms 22 afford spaced lands 25 and each has in it an elongated slit 26 for the passage of air and entrained liquid into the nozzle chamber 12. Each of the channel sections 23 and 24 comprises an outer vertical flange 28, an inner vertical flange 29 and a bottom web 30, the latter being provided with spaced projections 31 defining between them channels 32 for passage of air and entrained liquid when the projections 31 rest upon the surface 33 being cleaned. The inner vertical flanges 29 in effect form the front and rear walls of the nozzle mouth whilst the bottom webs 30 form the front and rear lips of the nozzle mouth.

Mounted in the nozzle body is a wiping blade 35 formed of resilient material and having a cross-section comprising an upper elongated bead 36, a web 37, and a lower portion 38 which is bifurcated to provide a pair of legs of strips 39 and 40. The bead 36 is clamped in the loop portion 21 of the plate 19 to hold the blade in position. A portion of the web 37 projects below the platform 22 of the bottom plate 19 and is relatively thin so as to provide a flexible hinge 42 to allow the lower part of the blade to rock between the position of Figure 3 and the position of Figure 4 as the nozzle is moved to and fro over the floor. The wiping strips 39 and 40 form substantially an inverted V, and the lower ends terminate in relatively sharp wiping edges 43 to contact the floor. The wiping strips are thin enough to allow additional flexing of the strips themselves independantly of the flexing of hinge 42. The wiping strips 39 and 40 are co-extensive with the adjacent inner nozzle walls or flanges 29, and with them form end openings 48 and 49 as shown in Figure 2.

The wiping strips 39 and 40 extend below the hinge 42 sufficiently far to ensure that in the stationary position shown in Figure 1 the wiping edges 43 are substantially in the plane of the projections 31 so that they just contact the surface being cleaned. As the nozzle is moved to and fro over the surface, the blade is rocked to and fro about the hinge 42 due to the combined effect of turning about the hinge 42 and flexing of the wiping strips themselves the wiping edge of whichever blade is extending downwards may still remain substantially in the plane

of the projections 31. The wiping edges 43 are spaced apart a distance about half the distance between the front and rear flanges or walls 29 of the nozzle mouth, so that as one of them moves down to a substantially vertical central position the other one will move across substantially into contact with the adjacent vertical flange 29 so as to close off that half of the nozzle mouth. The travel of the strips required is substantially less than the complete width of the nozzle inlet and in fact is about half that width.

In operation a liquid detergent is spread over the surface to be cleaned and may be scrubbed to loosen the dirt. After a suitable area of the surface has been scrubbed the suction wand 16 is connected to a suction type water pick-up device to apply suction to the nozzle. The wand is then operated to move the nozzle to and fro over the wet scrubbed surface. As the nozzle is moved in the forward direction as indicated by the arrow 46 of Figure 3, the forward wiping strip 40 of the wiping blade is moved downwards, by the friction of its wiping edge 43 with the floor, and causes the blade to pivot about the hinge 42 to the position shown in Figure 3, in which it will be seen that the rear wiping strip 39 of the wiping blade 35 substantially closes the rear half of the nozzle mouth. Accordingly as indicated in Figure 3 the flow of air is concentrated in front of the front wiping strip 40, and this is just the position where the liquid will also be accumulating due to the fact that the front wiping strip 40 pushes it in front of it in the manner of a squeegee. The liquid on the surface 33 in the path of the tool thus flows through the channels 32 between the projections 31 of the front nozzle lip whilst at the same time a high speed flow of air is entering through these same channels due to the suction in the nozzle. Thus liquid and air move into the space between the front wiping strip 40 and the nozzle front wall 29 and are sucked up through the front slit 26 into the chamber 12 as indicated in Figure 3.

When the tool is moved in a rearward direction, as indicated by the arrow 47 of Figure 4, the converse operation occurs. Thus the blade initially returns to the position of Figure 1 and then swings on to the position of Figure 4 in which the rear wiping strip 39 of the blade engages the floor and is bent by it as it swings down to a substantially vertical position, whilst the front wiping strip 40 closes the front part of the nozzle mouth. Liquid passes through the channels 32 of the rear lip, through which a high speed current of air is also flowing, and together with liquid collected in front of the rear strip 39 acting as a squeegee is carried up by the air through the rear slit 26 into the nozzle.

In addition further air flowing in through the openings 48 and 49 at the ends of the nozzle assists in carrying the liquid up through the slit 26 into the nozzle chamber

5 12.

WHAT WE CLAIM IS:

1. A liquid pick-up suction nozzle including a hollow body affording an elongated suction mouth having front and rear lips, characterized by a resilient blade mounted in the nozzle and having a pair of parallel wiping edges spaced apart a distance not less than approximately half the distance between the nozzle lips and capable of rocking as the nozzle is moved to and fro over the floor, so that as each edge moves approximately to the middle of the nozzle mouth the opposite edge moves close to the adjacent lip of the nozzle, so that as the nozzle moves forward its rear half is substantially closed and as it moves backwards its front half is substantially closed.

2. A nozzle as claimed in Claim 1 in which the blade includes a thin hinge portion permitting it to rock due to its own resilience, and below the hinge portion widens out so that the spacing between its wiping edges is substantially greater than the thickness of its hinge portion.

3. A nozzle as claimed in Claim 2 in which the lower part of the blade is of inverted V section, the two limbs of which respectively afford the two wiping edges.

4. A nozzle as claimed in Claim 3 in which each limb of the V is sufficiently slender to flex independantly of the flexing of the upper hinge part.

5. A nozzle as claimed in Claim 4 in which, in the position of rest, both wiping edges lie substantially in the plane of con-

tact between the nozzle lips and the floor, and the flexibility of the individual limbs in relation to that of the hinge portion and the dimensions of the parts are such that when each wiping edge rocks to the centre of the nozzle it can remain substantially in the said plane.

6. A nozzle as claimed in any one of the preceding Claims in which the lips are formed with alternating projections and recesses so that while the projections rest on the floor liquid and a high velocity air stream can pass through the recesses of the leading lip.

7. A nozzle as claimed in any one of the preceding claims in which the mouth of the nozzle is defined by a bottom plate having a central portion carrying the blade and elongated slits to the front and rear of the central portion to allow air and liquid to enter the nozzle.

8. A liquid pick-up suction nozzle as specifically described herein with reference to the accompanying drawings.

KILBURN & STRODE,

Agents for the Applicants.

